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ABSTRACT

Nontraditional instruction is increasingly available through the Internet and other technology-based delivery systems. The telecommunication network now in place can distribute high quality educational materials to students. This briefing paper argues that the "virtual university" created by the technological delivery of instruction, while providing access, lacks formal recognition by employers and institutions of higher education provided by credentialing and certification systems. Certification and quality assurance should focus on assessment of learning and learners, based on specific, standardized, and widely accepted competencies rather than on courses or other instruction units delivered by providers. Assessments must be acceptable to employers and other institutions and be conducted with integrity. Credentialing and certification may be implemented incrementally and regionally and through a variety of types of organizations. (PRW)

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HIGHER EDUCATION AND HIGH TECHNOLOGY: A CASE FOR JOINT ACTION

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EXECUTIVE SUMMARY

This briefing paper argues that the key feature of a "virtual university" is less the delivery of instruction through the use of technology, but the formal recognition of learning achieved in this manner--the awarding of transferable credit, certificates, and, eventually, degrees. This argument is based on the observation that non-traditional instruction is increasingly available over the Internet and through other technology-based delivery systems; provided by institutions of higher education and by thousands of other individuals and organizations. What is missing is the ability to have learning acquired from many sources **recognized** by those for whom academic credit and credentials are an important currency--employers and institutions of higher education in particular. Absent a response to this need, much of the promise of technology based education will not be realized.

Approaches to certification and quality assurance in the virtual university should therefore have the following characteristics:

- a focus on assessment of learning and learners rather than on instruction and providers.
- assessment based on competencies rather than courses or other units
- assessments that deal directly with specific, standard, and widely-recognized combinations of knowledge, skills, and experiences required to make an individual eligible to receive an award (a degree or certificate). The basic components might be

  - basic skills
  - vocational/professional skills
  - disciplinary knowledge
  - general education (breadth of knowledge)
  - civic roles and competencies

- assessments must have the acceptance of end users (employers and higher education) and be conducted with complete integrity

This credentialing and certification function could be housed in a variety of organizations--a university, a consortium of universities, an existing interstate organization, or an organization established expressly for this purpose. The functions can--and should be--implemented incrementally. Many of the assessment technologies are already available and could be implemented fairly quickly. Others will have to be developed and implemented over a longer time frame. For reasons of both cost and credibility, it would be appropriate to undertake this activity on a regional basis.

HIGHER EDUCATION AND HIGH TECHNOLOGY: A CASE FOR JOINT ACTION

The Problem

Each of the Western states is feeling in its own way the press of increased demand on its system of higher education. In some states, this increased demand takes the very visible form of larger numbers of students enrolling in the state's colleges and universities. Even in states that are not experiencing enrollment growth now, and may not in the future, demands being placed on institutions are growing rapidly. Where the requirement is not to serve more students, it is uniformly to serve them better. There is a growing recognition--among employers, policymakers, and institutional leaders--that students must leave higher education with greater levels of knowledge and skill than they have in the past. The economic strength and the social well-being of the individual states and of the nation are heavily dependent on the ability of educational institutions to respond to the challenge of improving the abilities of individual citizens.

But demands don't stop there. There are also demands that colleges and universities take a more active role in helping to address some of the more pressing needs of society. These needs vary from state to state but often include such issues as:

- contributing to the improvement of K-12 education
- regional economic development
- developing workplace skills in functionally illiterate adults
- helping to address problems of youth violence and juvenile delinquency
- finding ways to deliver health care to citizens who are underserved because of geography or economics

Whatever the specific nature of the demand, states' needs are considerably larger than their capacities to pay for solutions. The fact of limited resources and competing demands for the resources that are available create conditions in which states simply cannot afford to respond to growing demands with commensurate levels of funding.

When faced with tough problems of this kind in the past, this country has very frequently turned to technology to solve them. Such is the case here. Leaders both inside and outside the higher education establishment have high hopes that technology can provide the means through which:

- education can be delivered effectively to students who live in remote areas

- education can be tailored to the learning styles and needs of the individual
- the overall productivity of the educational process can be improved
- higher education can become less isolated from other sectors of society with which stronger relationships are of critical importance

If these hopes are to be realized, several conditions must be met. First, an adequate technology infrastructure must be in place. If technology is to provide the means by which education is delivered to communities, businesses and homes throughout a state, the physical network that allows the delivery of education to these sites must be in place. Telecommunications links, in essence, must become another of the "utilities" that is found in every community. Where once the vision was to link the various parts of a state with interactive video capacity, this vision is rapidly being supplanted by one in which the connections are computer based and are made possible by connection to the Internet and the World Wide Web. This latter vision is well within reach; it is one of the features of SmartStates.

Second, high quality educational materials are needed that can be distributed across this network. Having the "pipeline" is of little consequence if there is no "product" to run through it. From some perspectives, it can be argued that this is not a problem at all. Thousands of providers have already placed an enormous variety of educational materials on existing networks. While these provide individual learners with opportunities to obtain bits and pieces of an education because they are not designed to fit together, they are at best incomplete answers.

If technology is to be the device by which increased demand for traditional higher education is to be accommodated and by which productivity of the educational enterprise is to be enhanced, then materials consistent with existing college curricula must be forthcoming. And so they are; some wonderful examples of technology-based curricular materials have in fact emerged in the past few years. A review of the experiences associated with the development and use of such materials suggests that:

- they can be very effective vehicles for achieving student learning
- their use significantly changes the role of the faculty, from transmitter of information to designer of materials and "coach" in its use and interpretation
- it is expensive if done well

The latter point is especially important in the context of the WGA agenda. Development costs are such that they can be justified only if the resulting materials are used by very large numbers of students--numbers far larger than are found in any single institution and often larger than the numbers of students in a single state. Different institutional providers, with help from

foundations and other third-party funders, or through consortia that allow them to pool funds, will undoubtedly continue their course and curriculum development activities. But the need remains to "create a market" for such materials and ensure that those materials are distributed to (and accepted by) an audience large enough to justify the initial investment costs. This is a task in which regional approaches and solutions are especially worth investigating.

Finally, there is the need to ensure that learning actually occurs. As long as education was controlled by the provider (a single college or university), that provider was in a position to certify that a student had, in fact, acquired knowledge and skills consistent with the expectations associated with any award that may have been granted. Problems started arising when students began getting their educations from multiple (but still quite traditional kinds of) higher education institutions. After many years of trying, educators are a long way from ironing out all the kinks associated with transferring credit from one (accredited) institution to another.

The new learning environment is rapidly moving beyond the capacity of established quality control and certification mechanisms. Students now have access to learning opportunities provided by literally thousands of different organizations. Very few of these learning opportunities are "courses" in the traditional sense of that word. Rather, they are learning "modules" that allow a student to acquire a single new skill or a useful bit of knowledge. Further, most are not offered by traditional institutions of higher education. Therefore, the quality of what they offer is not assessed by traditional quality control mechanisms like accreditation.

This does not mean that "quality" is not present. More importantly, it does not mean that real learning does not take place through the interaction of students with materials that they find for themselves through the Internet or other technological avenue. While learning may have occurred--knowledge acquired and proficiencies in certain skills achieved--this learning largely goes unrecognized. Most students who have learned in this way haven't received "credit hours." They certainly haven't been awarded degrees that signal a particular level of academic accomplishment to the external world. And certification and credentialing is the currency most important in any transaction between individual and employer or between individual and educational institution. As long as learning is not recognized formally, under the current rules of the game, it benefits the individual little in the employment market or anywhere else that higher education provides an important gatekeeping function.

The conclusion is that access to learning opportunities is not the key problem. Opportunities will be made available in ever-increasing numbers. Indeed, there is literally no way to control the number, the variety or the quality of educational providers who can deliver their wares within the boundaries of any political jurisdiction. Certainly, licensing mechanisms can continue to work--at least, in the short term--to regulate the providers proposing to deliver complete degree programs within a state's boundaries. But the flood gates are open for those who make learning opportunities available in much smaller bites. This flood cannot be turned back, nor should it be.

While access to learning opportunities will increasingly not be a problem, credentialing and certification of the learning that accrues will be. While instruction can come from anywhere, credentialing remains the purview of the faculties of colleges and universities. As long as learning is accumulated in course-size bites and provided by recognizable organizational peers, colleges and universities can normally find a way to recognize learning and to convert that learning into the coin of the realm, the student credit hour. Learning that occurs in other formats and outside the context of intentional education has little chance of being recognized. Ensuring that individuals can have the learning they have achieved recognized in ways acceptable to outside audiences--primarily employers and institutions of higher education--is the critical problem to be overcome. Absent a solution to this bottleneck, much of the promise of technology-based education will not be realized.

Outlining a Solution

If quality of education is to be assured and learning that takes place outside formal settings or through "unconventional channels" is to be recognized, approaches to quality assurance will have to be dramatically changed. A first feature of this change is that:

- the focus must be on **an assessment of learning**

The number and variety of providers is potentially unlimited, and there is no way to limit their access to consumers of education. Even if there were, the national mood is much more to foster competition in the marketplace than to protect provider monopolies. In this environment, mechanisms consistent with educational realities must be established. For those students who continue to obtain their education through traditional means at traditional institutions, established mechanisms of institutional and programmatic accreditation may continue to suffice. For the others, however, mechanisms that allow individuals to gain recognition by directly demonstrating that knowledge and skills have, in fact, been acquired will become increasingly important.

A second important characteristic of a potential solution therefore is that:

- this assessment be based on **competencies** as the basic unit of academic accounting

Much of the learning that occurs outside traditional instructional contexts--whether on-campus or off--will not be organized in units of courses. Further, end-users of the certification process--employers and others--will demand specific demonstrations of competence. When education is the product of providers they don't know and in forms outside historical norms, they have no basis for establishing "equivalencies". Of course, they have equally little basis for establishing such equivalencies within the traditional framework, but because of its very unfamiliarity the burden of proof will be much higher for learning acquired through nontraditional and "extra-institutional" forms. This is a fate that accompanies any significant change from the status

quo.

A third major characteristic of any potential solution is a requirement that:

- specific "packages" of competencies--knowledge, skills, and experiences--be assessed in such a way that they can be **combined into generally recognizable awards** (certificates or degrees).

Most of the formal recognition of learning that occurs in institutions of higher education--whether credits earned or degrees or certificates awarded--is based on the completion of a set of specific courses. But courses are artificial, and often arbitrary, divisions of learning established more for the convenience of the providers than the needs of the learner. Further, the successful completion of a series of courses doesn't necessarily mean that the student has acquired the kinds of knowledge or has mastered the important competencies that come from synthesizing and applying the results of individual courses. As an analogy, it is possible to take a set of building materials, each item of which is functionally sound and aesthetically pleasing, and create a structure that has neither of these qualities.

Recognizing this phenomenon, and the reality that much learning takes place outside course units entirely, an alternative form of competency aggregation is required. One possibility is that the focus be placed on certifying combinations like:

- basic skills
- vocational and professional skills
- specific areas of disciplinary knowledge
- general education--knowledge of the basic substance and methods of inquiry of the sciences, social sciences, humanities, and arts
- civic roles and competencies

These factors or components, along with the recognition that there are different levels of mastery within each, can serve to delineate the specific levels of competency typically associated with different kinds of degrees. The following simple framework arrays these typical levels of mastery and can serve as a guide for developing the kinds of alternative certifications that will eventually be required. As an added benefit, the assessment of learning within this conceptual structure would create a badly needed opportunity to reexamine the real meaning of the awards currently granted on the basis of successful completion of traditional courses.

BASIC COMPONENTS

Levels of Mastery	Basic Skills	Vocational Skills	Discipline Knowledge	General Education	Civic Roles & Competencies
Basic	AA	AA	BA	AA	AA
Intermediate	BA	BA	MA	BA	BA
Advanced		Prof/ Grad	Doct		

Perhaps more important, this framework provides a beginning point for a conversation about assessment of learning in **all** provider formats and suggests ways in which development of assessment methodologies might progress--for example, by focusing on basic skills, or on disciplinary knowledge in a few selected fields.

Finally, any mechanism created to assess learning acquired through distributed means must

- have the **acceptance of end users** and be conducted with complete integrity.

Any attempt to award credit or to certify credentials for learning acquired outside the normal higher education structure will face considerable skepticism, if not outright hostility. This means that performance levels will need to be clearly established--and be established with considerable involvement of external audiences. Employers must be involved in specifying levels of performance for vocational skills. And academics must be involved in developing standards for demonstrating mastery of disciplinary knowledge. Both audiences should be involved in developing performance expectations for basic skills. But there is every reason to believe that this is a very doable task. Faculty are already heavily involved in developing measures of mastery in specific disciplines (witness the development of the Graduate Record Exams); and employers are frequently major participants in developing vocational skill specifications and assessments for community college programs.

Given basic technical feasibility, there will still be hurdles to overcome. Such assessments would have to be handled by an entity with status and standing. Ultimate tests for such an arrangement would be affirmative answers to the following questions:

- Is the learning certified by this entity recognized as partial fulfillment of the degree at other, accredited institutions? In other words, can its "credits" be transferred?

- Are "degrees" awarded by this entity accepted by employers and other educational organizations in the same way as degrees awarded by other types of educational institutions?

If such independent certification of learning--arguably the largest obstacle to widespread use of technology-based education--were to become a reality, students and other clients of the educational enterprise would have many more options and many more reasons for reconnecting with formal educational organizations. Students could receive credit for learning acquired in a myriad of ways; the issue would become not how the learning was acquired but whether it was acquired. For most students, independently-certified learning would constitute only part of an education that would ultimately be completed at a traditional institution. For some, however, this mechanism could provide a credentialer of last resort--awarding degrees and certificates to students who had acquired the requisite knowledge and skills, but who had not met other, and arguably irrelevant, requirements for graduation (for example, having taken a year's worth of education in residency at a single college or university).

Employers would benefit because they would receive students with certified levels of knowledge or skills in areas important to them. In addition, the system could be tailored to meet vocational or professional skill specifications that might be more narrowly defined than the typical degree program. Much as the automobile industry certifies mechanics who specialize in electrical systems, fuel systems, brake systems, etc., so other industries could enter into discussions that would allow detailed specification--and assessments--of particular learning outcomes meeting the unique needs of their industry.

Certainly, funders of higher education (most explicitly, the state and individual students) would benefit from a significantly enhanced capacity to assess learning outcomes. By harnessing more of the capacity of extra-institutional educational providers, states can respond to greater demands without commensurate growth in funding for public colleges and universities. As a result, there is considerable promise of increasing the productivity of the overall educational enterprise. Individual students gain from the recognition of learning that occurs outside the traditional classroom (and without incurring additional costs associated with attendance).

Finally, colleges and universities themselves stand to benefit. They have the potential to tap a new market, those students who can have some of their informal learning recognized and can therefore come to college for completion of a program. Such an arrangement would also let faculties focus on what they do best--design and develop learning experiences and help students interpret information which they encounter--and let the more mundane instructional task of information transmission be handled through technology or other means.

There is a final salutory effect to a response that puts certification of student learning at the core. It forces the specification of learning outcomes as a precondition and leads directly to implementation of a more general "standards-based" undergraduate education. In this way, independent certification can potentially serve the function of a "charter university"--an

organization that is not intended to supplant existing institutions, but to encourage them to change. If standards-based education can be proven to work outside the ivied walls, there is little reason to maintain that it couldn't work inside as well.

Implementation Considerations

If sufficient interest in incorporating an assessment and credentialing component for a "virtual university" in the West exists, there could be a great deal of flexibility in how it is implemented. There are numerous options regarding an organizational home for such an activity. It could be housed at an existing university or consortium of universities. It could be housed at an existing interstate organization such as WICHE. Or it could be housed in a new organization created expressly for the purpose; National Technological University in this respect has many of the desirable characteristics. There could even be different groups for different kinds of certification. Whatever the mechanism, the critical requirement is that it be credible to the higher education community, to employers, and to the public at large.

Further, it can be--and should be--implemented incrementally. There is no reason to try to do everything at once. One strategy might be to focus on those areas where assessment methodologies are already available and well-proven--for example in basic and vocational skills. This would allow learning consistent with a complete vocational certificate or associate degree to be assessed and certified. It would also provide opportunities to work out the necessary protocols for transferring "credits" among other educational institutions. It is unlikely, however, that the desired range of learning assessments in domains beyond basic and vocational skills can be accomplished with readily available tools. In the end, there will be a need for some conceptually difficult, and expensive, developmental work.

For several reasons, it would be appropriate to undertake such development on a regional basis. The ability to share costs is but one of them. Perhaps more important than financial capital is political capital. Joint action by multiple states would add to the initial credibility of the enterprise, help to ensure acceptance by employers and other external parties, and provide a more inviting partner for the testing companies and other organizations with whom cooperative activities will ultimately be desirable.